VOLUME XV, NO. 4 / WINTER 1998

ARIZONA ANTIQUE RADIO CLUB NEWS

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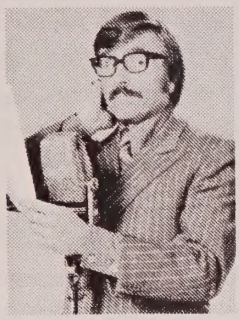

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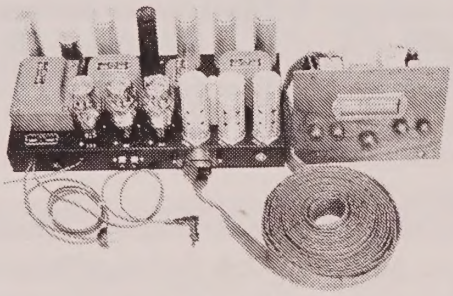

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On the cover: Andy Ooms on the family tractor in Corsica, South Dakota. Andy's story of radio listening in his home town begins on page 4.

Arizona Antique Radio Club

The Arizona Antique Radio Club was organized in 1983 for the preservation of the history and artifacts of radio and television, and for the advancement of knowledge and appreciation of radio technology and communication. The Club is a non-profit corporation organized primarily for the mutual assistance of radio devotees and collectors in Arizona. Membership, however, is open to any persons who have an interest in radio and television history, preservation, restoration, and collecting.

Meetings are held from September through May and consist of touring collections, presentations of technical, historical or restoration information, thematic displays of radios and the autobiographical experiences of the members. Our antique radio Swap Meets are usually scheduled for the March and November meetings. Members of the Board of Directors are elected at the annual business meeting in May. Most meetings are held on weekends in the Phoenix area, and when possible, elsewhere within Arizona.

Membership dues are $18 (individual) or $20 (family) per calendar year and provide access to all club benefits including the quarterly issues of the *Radio Club News*. Send dues or membership inquiries to: **Arizona Antique Radio Club, 10513 E. Clinton, Scottsdale, AZ, 85259, phone (602) 860-8951.**

The Arizona Antique Radio Club News is the quarterly publication of the Arizona Antique Radio Club, Inc. It is mailed First Class to current members at the beginning of March, June, September and December.

Contributions: submission of articles, news items, fiction, photographs and other materials relating to radio history and collecting are greatly appreciated, particularly if they have an Arizona connection. All members are encouraged to broaden their interest in the hobby by sharing their experiences, opinions, knowledge and observations with the club through its publication. Send materials for publication to **Arizona Antique Radio Club, 2025 E. LaJolla Dr., Tempe, Arizona, 85282-5910. Phone is (602) 730-6058**. Fax available on request.

Advertising: classified ads of reasonable length are free to members. Display advertising is also available, contact editor for current rates. Deadlines are the 10th of the month before publication. The club accepts no responsibility for transactions made in regards to published ads.

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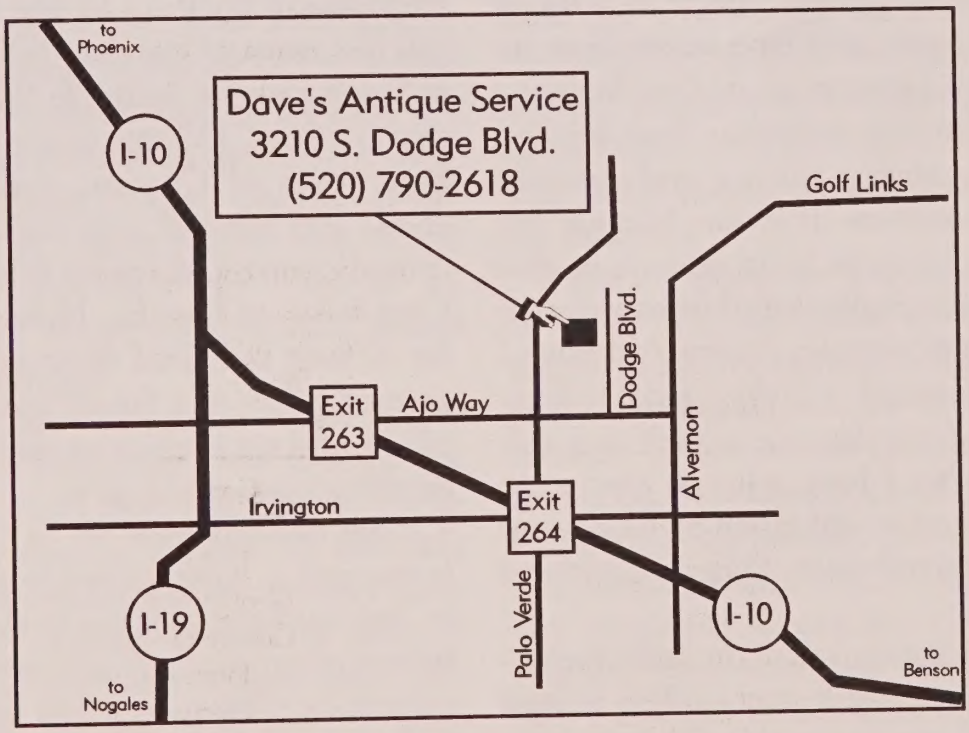
The
Arizona Antique Radio Club

Spring Swap Meet

Saturday, March 6
at Dave's Antique Service
3210 S. Dodge Blvd, Tucson
Starting time is 8am

Please no setting up or selling until 8am

At the request of his family the club will be selling radios, tubes, parts and many other items from the estate of John Sabo at this meet.



April and May Meetings

When: April 3 and May 1. **Where: To be announced.**

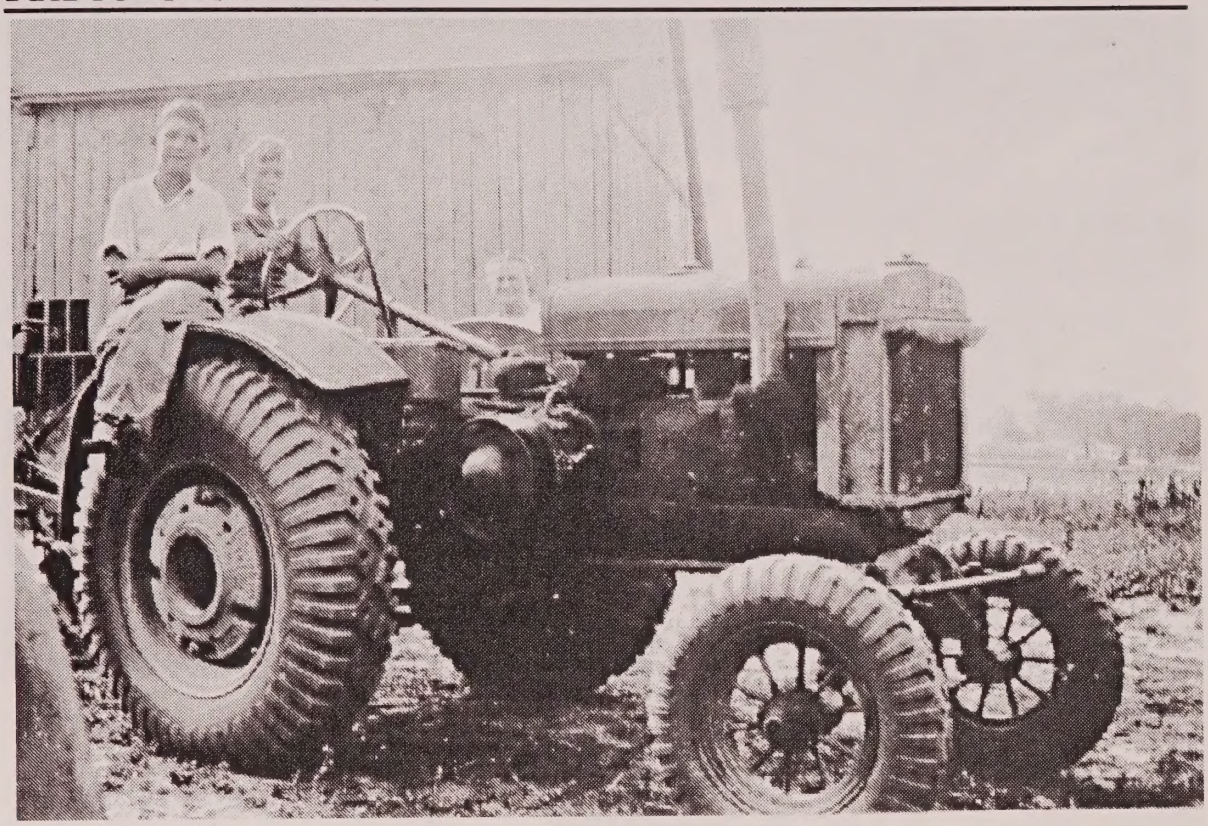
RADIO YOUTH

by Andy Ooms

Sometimes I wonder why I subscribe to about a dozen radio-related magazines, listen to a lot of short wave, and have more than an average interest in station formats, AM distance reception, broadcasting history, station history, and pre-solid state receivers. It is not because my career has been radio-related, or that I am technically skilled or knowledgeable in electronics theory. Although I am interested in antique radio collecting, I don't describe myself as a collector. Yet I have a lot of interest in radio, and would much prefer a world without television than one without radio.

This description of the radio memories of my youth may explain at least part of my fascination with the medium. Until I graduated from high school in 1956, I lived in the relative isolation of a farming community on the prairie and had never lived in a city of any size or had any access to television. I grew up in the 40s and 50s in a town of less than 500 people in South Dakota. As late as 1956, only two or three TV sets existed in my hometown of Corsica, and towers about 100 feet tall were required for sporadic snowy reception from Sioux City, Iowa or Omaha, Nebraska. So for as long as I lived there radio was an exotic link to a far off rest-of the-world, and my inquisitive mind could hardly get too much of it.

How isolated were we in Corsica? It was and is, a great town to grow up in, but not because it was in the mainstream of national cultural trends (not even then necessarily a bad thing). It had no traffic signals, of course, but that was not particularly unique in small town America. I never used a dial telephone while living there, we

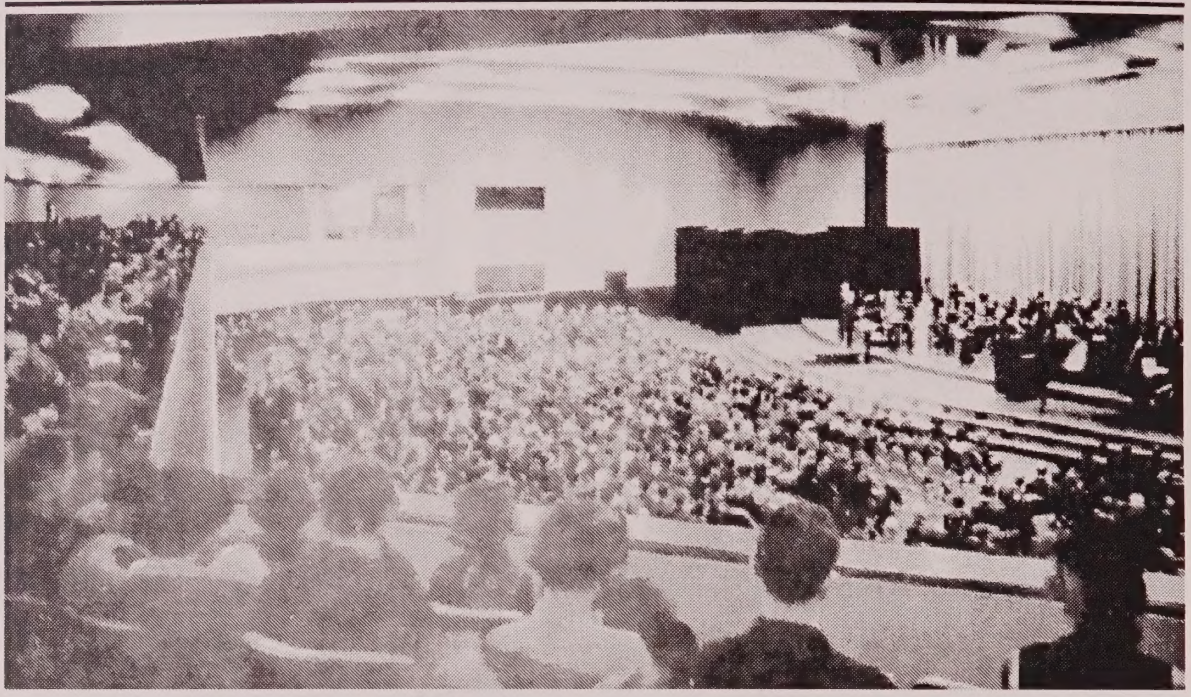


The author and his brother on the family tractor

told Central which number we wanted her to connect us to. And when I got to a city in Michigan to attend college at the age of 17, I heard of the National Football League, the National Basketball Association, and the National Hockey League for the first time. I don't believe that any of my 21 co-grads of the Class of '56 knew of those professional sports leagues either.

We knew a lot about major league baseball however, even though the nearest team then was 700 miles distant, primarily because of Mutual's *Game of the Day* broadcast every summer day to those areas of the country not near any major league team, secondarily because of pictures of players like Stan Musial and Bob Feller on Wheaties boxes. Also, our high school classes were suspended each year while we all gathered in study hall to listen to each World Series game played on a school day, as they were then scheduled for afternoons. In 1955, the Philadelphia Athletics moved to Kansas City, and some of their games were carried on a South Dakota station, but they never caught on as a local team for that area.

More on sports: for a short time in the 50s, CBS broadcast a Saturday afternoon radio program, *College Football Roundup*. It carried about ten minutes of live action from each of several high-profile schools of that era. In addition to current powerhouses like Notre Dame, Texas, Oklahoma and Michigan, teams like Navy and Harvard were included. Almost the only other sportscasts were state high school basketball tournaments, state Junior league baseball tournaments, minor league pro baseball (Northern League teams Aberdeen Pheasants and



The Cities Service Concerts were broadcast from the auditorium studio at Radio City in New York.

Sioux Falls Canaries) and some University of South Dakota and South Dakota State football and basketball games. These were, and are, Division II teams then having limited fan interest in a farm community with few college graduates. Not that any of us knew of the NCAA or its divisional status rules. South Dakota even today is the only state without at least one Division I team in any sport. North Dakota has one Division I team (hockey) and Alaska is blessed with two Division I teams, also hockey.

Last on sports - broadcasts of the Indianapolis 500 and heavyweight boxing, particularly if Joe Lewis was involved, were enjoyed by my father and me.

Although my sisters educated me that small people were not talking and making music in our Zenith console (probably after having given me the idea), I nevertheless obviously found the signals themselves to be fascinating. My mother discouraged radio listening to some extent, (at least the amount I was eager to do) on the basis that it could be a waste of time, that someone my age was not likely to sort quality programming from the more abundant type of programming, and that active mental and physical skills were more valuable than passive habits. On the same grounds, she greatly encouraged non-fiction reading instead of fiction. She also believed that radio programs with a lot of action or emotion could lead to nightmares, fear of the dark, restlessness, or other symptoms of anxiety in children. The term hyperactivity was not much in use then, but that is the syndrome she described. She did introduce me to programs she deemed worthwhile (actually they would be classified as worthwhile by almost anyone): the Texaco-sponsored *Metropoli-*

tan Opera on Saturdays (still presented by Texaco on NPR), and on Monday evenings, *The Cities Service Band of America*, conducted by Paul Lavalle, The *Telephone Hour*, *The Railroad Hour* and *The Voice of Firestone.* Yes, even at an early age, I detected a programming trend there.

My father worked in his general store all day six days a week and usually had a radio on there, so he was inclined to read without radio when he was home, although we all listened to *Fibber McGee and Molly* on Tuesday, and I listened with him to Drew Pearson and Walter Winchell on Sunday. Fibber and Molly have ever since been my favorite type of comedy. And why do I still remember they were sponsored by Johnson's Wax, Pearson by Adams Hats, and Winchell by Jurgens Lotion?

On Sundays, our family also listened regularly to *The Back to God Hour*, frequently to *The Lutheran Hour* and *The Hour of Decision* (with Billy Graham), and the music portion of *The Old-Fashioned Revival Hour.* I don't know about the last one, but the other three are still being broadcast 50 or more years later with pretty much the same format now as then. *The Back to God Hour* has yet to make its first request for contributions on the air, making it unusual, if not unique, in the history of religious broadcasting. *The Hour of*

Nadine Conner and Gordon MacRae on *The Railroad Hour* in 1952.
Below: Jim and Marian Jordan were *Fibber McGee and Molly*

Walter Winchell held forth with commentary and gossip from 1930 to 1957. Below: *Sgt. Preston of the Yukon.*

Decision still has Rev. Graham preaching, George Beverly Shea singing and Cliff Barrows announcing.

Due to my mother's rules, I was not allowed to listen to afternoon programming aimed at elementary school students. Naturally, I was keenly interested in those programs, and would find out the next day what had happened the afternoon before from those who did listen, or listen at other homes when I was allowed to visit, and I would try to be as knowledgeable about the programs as those who listened regularly. Examples of after-school or early evening programs I remember: *The Lone Ranger* (Cheerios), *Jack Armstrong the All American Boy* (Wheaties), *Sky King* (Peter Pan peanut butter, or was it Skippy?), *Straight Arrow* (Nabisco Shredded Wheat), *Wild Bill Hickock* (Kellogg's Sugar Corn Pops); *Terry and the Pirates* and *Sergeant Preston of the Yukon* (Quaker Puffed Wheat). Another trend is exposed: cereal serial sponsorship.

Do you remember when there were four major networks (ABC, CBS, MBS, NBC) and they were identified in oratorical tones, pronounced in full: "This is the Columbia Broadcasting System," almost never "this is CBS?" Those were the days of primarily full service stations-a variety of recorded music (live music frequently at ma-

Brace Beemer was one of five who played *The Lone Ranger* during its long run. He also played Sgt. Preston.

jor stations), network comedy, drama, quiz, and commentary programs, news, weather, and community announcements. Narrowcasting as practiced today with one type of music for a demographically defined market was unknown. Newscasts were not every hour, but when they were broadcast, about 4 times daily, they ran for 15 or 30 minutes. Another statement once familiar but unheard today: "And now we bring you an interlude of recorded music for your listening pleasure." This was used to fill in programming gaps, and to cover local or network technical difficulties. Full time news, sports, talk stations? Not until a few New York, Chicago, Los Angeles stations initiated that format in a daring move in the 1960s.

Kids listened to adventure programs until about high school age, then segued toward stations that played popular music, switching stations during the day as most stations varied their programming. Very little broadcasting was directed at the teen-age

The Dragon Lady, played by Marion Sweet in *Terry and the Pirates.*

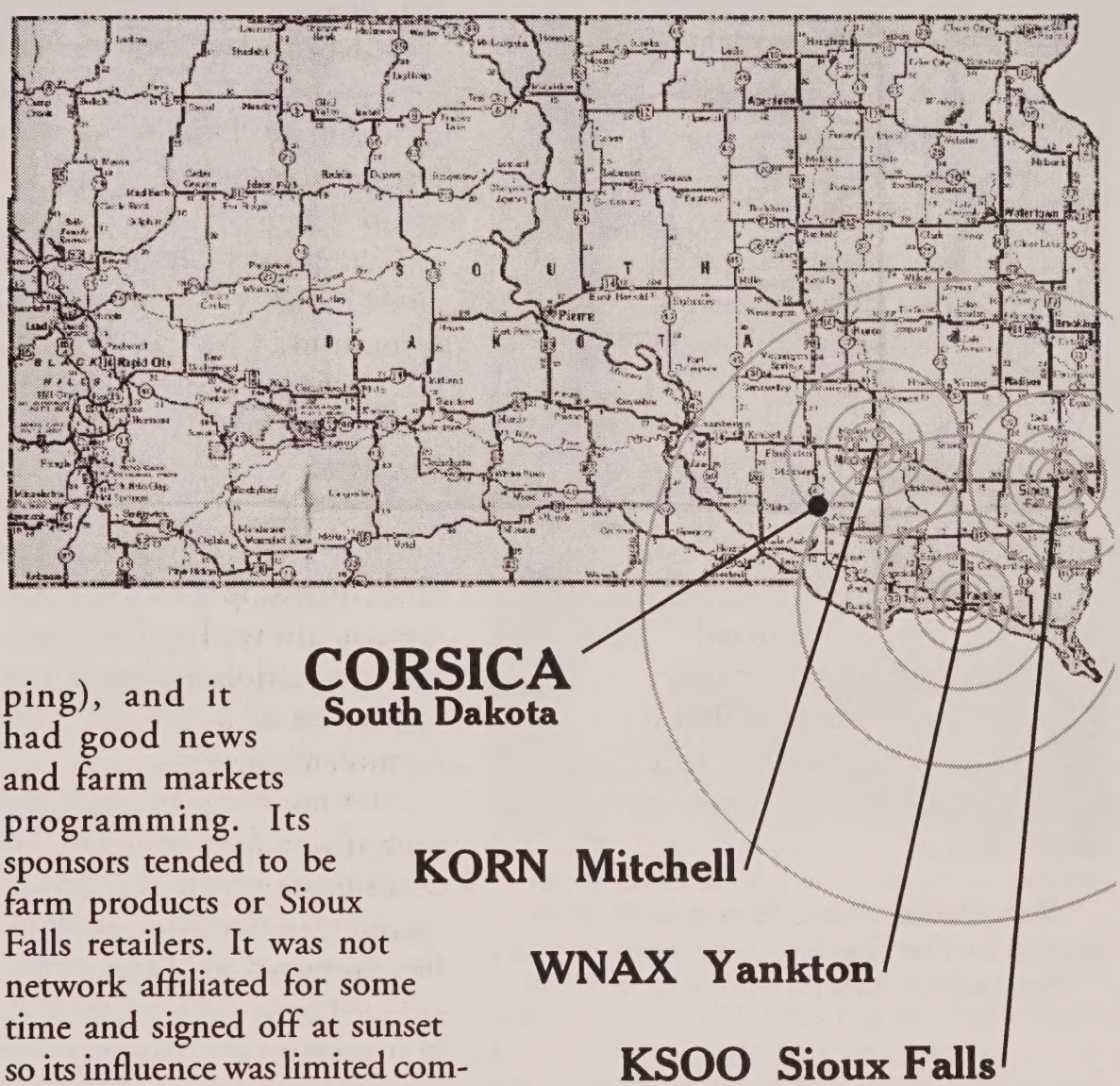
market, probably because teen income was practically nonexistent at that time (except for the essentials: cars, gas, tires). Some experimenters, such as myself, scanned the dial trying for distant signals, or unique or obscure programming, from several states. Program content was more interesting than audio quality. Adults were considered to be the basic market, and 95% of them in my area had their radio needs met by 3 stations: WNAX, KSOO, and KORN.

WNAX Yankton, SD had a booming signal (when I became more knowledgeable about details, I was amazed to find that it was only 5000 watts; it sounded like 50,000 to me living about 75 miles away). It covered major portions of 5 large states, and I heard its signal hundreds of miles from my home, when traveling various directions. Proud of its power, it always gave separate weather reports for each of the 5 states covered. Like many stations of that time, it was owned by a plant nursery/seed company. It was the only signal we could get any time of the day, night, or year in Corsica, except during severe thunderstorms in the summer. And like most stations, it signed off at midnight. It was popular for its farm news, regional livestock market and grain price reports, accurate weather reporting, local news, ABC (CBS after 1950) nighttime programming, and a long string of soap operas daily interspersed with *Arthur Godfrey Time* in the morning, extensive farm market news at noon, and *Your Neighbor Lady* in mid-afternoon with recipes and neighborly chat. I was astounded in October, 1998 to find out on the Internet that Your Neighbor Lady, Wynn Speece, is still actively broadcasting, 42 years after I moved away from the sound of her voice. I didn't really listen to her, as I was not her intended audience, but she was respected a lot, and many is the time I heard her voice throughout my youth in various homes, and passing car radios. She is approaching 60 years on the air.

WNAX is an old station, having obtained its call letters before stations beginning with W were reserved for east of the Mississippi locations, and therefore has always been the only South Dakota station not beginning with K. Because of its far-flung signal, its commercials were for national products. Its non-network sponsors (like most major farm country stations) were fencing materials, pesticides, herbicides, rat poisons, farm equipment, livestock medications and feed, and seed corn.

Do you remember when big city stations had their own instrumental and vocal musicians? WNAX had several, including the Tunecrackers who would attempt to play songs suggested by listeners, and the WNAX Bohemian Band, which played polkas and waltzes at various locations live, some nights for fifteen minutes after the 6 pm news, and for about 4 hours, along with guest or regular country musicians, on the live weekly broadcasts of the *WNAX Saturday Night Barn Dance.*

KSOO, Sioux Falls, SD was listened to because Sioux Falls was the major city in the state (about 100 miles away and traveled to frequently for shop-



ping), and it had good news and farm markets programming. Its sponsors tended to be farm products or Sioux Falls retailers. It was not network affiliated for some time and signed off at sunset so its influence was limited compared to WNAX.

KORN, Mitchell, SD, a 250 watt Mutual affiliate 40 miles away, was big in our town. The call letters were appropriate as Mitchell is the home of the world famous one and only Corn Palace. Mitchell's adult amateur baseball team was the Cobs; the junior team was the Kernels; its radio station was, and is, KORN. The station had news, sports, and weather that covered our area. Being Mutual, it carried *Queen for a Day*, the daily major baseball game in the summer, the afterschool adventures of *Wild Bill Hickock, Straight Arrow* and later, *Bob and Ray*. On Sunday, it had the afternoon suspense and adventure programming lineup that included *The Green Hornet* and *The Shadow*. It had primarily local sponsors so its supermarket specials caused some to drive to Mitchell for grocery shopping (not enthusiastically appreciated by our grocer's family). And being Mutual, it had no all-day lineup of soap operas, so it had a lot of local recorded pop music (with, among others, later-to-be-famous on *Laugh-In* disk jockey, Gary Owens). It had music all afternoon, the prosaically named *1490 Club* (it was at 1490 on the dial) and in the morning it broadcast

Bret Morrison and Grace Matthews played in *The Shadow*, a popular mystery show which aired from 1930 to 1954.

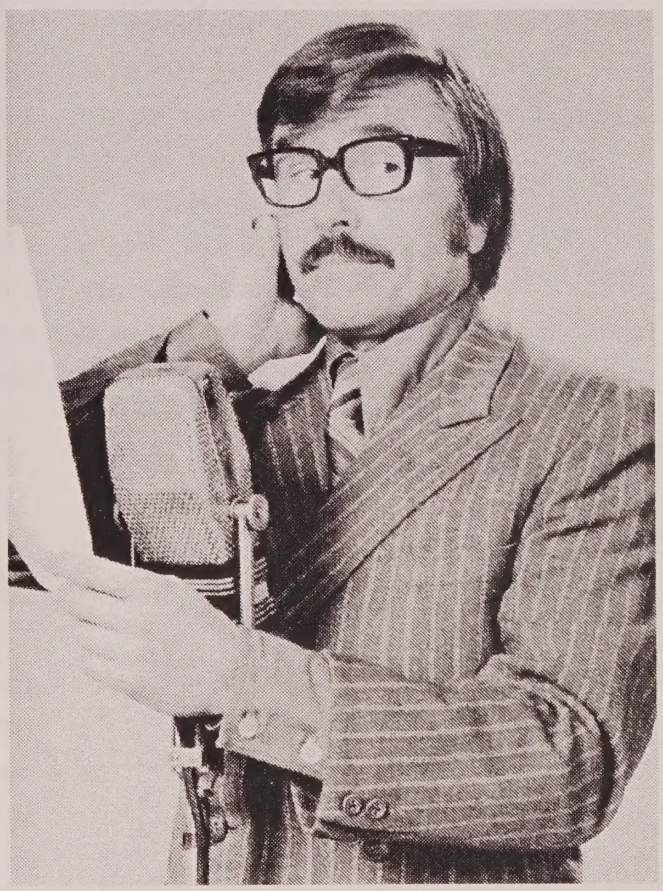
Requestfully Yours, which carried dedications of the latest songs ("Irene", "Goodnight", "On Top of Old Smoky", "How Much is That Doggie in the Window") from people we might know to other people we might know celebrating birthdays or anniversaries. It was the only station the radio in our store could get due to fluorescent light interference, and since I worked in that store almost full-time after I started high school, it was a large part of my life. Due to its low power, it was not usually listenable after sunset. When the Mutual broadcast of the commentary of Fulton Lewis came on KORN at 6:15 pm, it was time to start turning off the lights and close up and head home for the night, except on Saturday night which was too busy for radio listening for us anyway.

Regional stations for us included ones in Minneapolis, MN; Sioux City, IA; Omaha, NE; Jamestown, Fargo, and Bismarck in North Dakota plus several other smaller city signals in those adjoining states. I listened to almost all of them to some degree; few others did as it was a little work to find them, and naturally their signals were relatively weak compared to the South Dakota ones.

Daytime listening really was rather limited compared to that available to people in large cities, due to a scarcity of stations, the distance between towns with stations, and the number of small powered stations, as appropriate for small towns. Although daytime only stations still exist on the medium wave (AM) band, there seemed to be many more of them then, and I always found them quaintly interesting. Their end of day programs called for creative scheduling as the end of day could come anywhere from about 4 to about 8:30 pm.

Nighttime listening was a different matter, of course. WNAX was the only South Dakota station available as the others signed off at sunset, or didn't have enough power to send a clear signal to our town. But at night, we could usually hear good signals from several Chicago stations (more about them

coming up) plus WWL, New Orleans; KSL, Salt Lake City; KOB, Albuquerque; KXEL, Waterloo; KVOO, Tulsa; KOMA, Oklahoma City; KOA, Denver; KRLD, Dallas; WOAT, San Antonio; WBAP, Fort Worth; and the exotic to me Mexican stations, XERF, with a Del Rio mailing address, and XELO, across the border from El Paso. The Mexicans were 150,000 watters, 3 times the United States stations' allowable power, so they broadcast in English with a northward directed antenna pattern and I am told could be heard to some extent in all the lower 48 states and some of the Canadian provinces.



Gary Owens, of TV's *Laugh In*, got his start at Mitchell's KORN.

As this magazine understandably prefers its articles to have an Arizona connection, if possible, all I can say is that I never received an Arizona signal, not even KTAR or KOY. KTNN, Window Rock, which probably can be heard in South Dakota nowadays, didn't exist. Neither did I ever get any Oregon, Washington, California, or Nevada signals. WLW, Cincinnati was the only station east of Chicago received; no Detroit, Cleveland, Philadelphia, or New York sounds. Even the other two states sharing part of a border with South Dakota, Wyoming and Montana, were never heard in my far eastern part of the state. And surprisingly, although I caught Mexico about every night I tried, I never got a Canadian station.

My research was exhaustive, if not exhausting. The majority of stations, even if broadcasting at night, signed off at midnight or close to it. and signed on around 6 am, (remember the "Star Spangled Banner" and sonorous announcements accompanying it at sign-off and sign-on? Remember some stations having a sermonette, prayer, or Scripture reading at the beginning or end of the broadcast day?) so the midnight to dawn stretch was great for clear signals from the few but powerful all night stations. Most mornings I was awake and listening at 5 catching the farm reports and wake-up music from around the middle states, waiting for the rational members of the family and the rest of the town to wake up, (although the farm kids were mostly up and milk-

ing by then, unable to understand someone voluntarily getting up that early). Some nights, I was awake an hour or two during the night listening to far-off signals.

When I was 11 or 12, I ran into a *White's Radio Log*. I immediately memorized the call letters, frequency, power, affiliation, and schedule of all the South Dakota stations. All 15 of them. Some I never did hear due to distance and low power. Only one, WNAX, could be counted on to have a listenable night time signal to my town.

I also developed an interest in network programming, and generally tried to keep track of which programs were on each of the four majors, whether or not I could get them locally. Night programming was fairly well known to most people, due to magazine and newspaper references and word of mouth. But I was interested in daytime programming as well. In addition to the huge line-up of soaps on CBS and NBC, including the unique dynasty of *One Man's Family*, do you remember *Grand Central Station, Queen for a Day, Arthur Godfrey Time, Art Linkletter's House Party* and the *Breakfast Club* with Don McNeil?

My 11 year old mind presumed that the number of networks was permanently established, and that 4 was the appropriate number, but one day scanning the dial, I heard a fifth network - Liberty Broadcasting System. I only heard it on one small station in Sioux Falls, and it disappeared after a year or two, but it was a cheerful surprise to me when I first heard it soon after it was born. It shamelessly imitated Mutual with a baseball game of the day, and did so with a teletype game report to an announcer in a studio, but on the theory that two of a good thing is better than one of a good thing, I didn't mind at all. It did exist in the early 1950s, but running across people who remember it is a seldom occurrence. I don't know what programming it had beside baseball; the only other program I ever heard on it was a network disc jockey, in itself a rare occurrence as disc jockey programs were usually local.

Don McNeill of the *Breakfast Club* (left) talking to a fan. The popular show ran for 35 years, going off the air in 1968.

The cast of *One Man's Family*

NPR did not exist. But we could get good and unique programming from stations owned by the University of South Dakota, and Iowa State University.

Who would have dreamed that one day the NBC, CBS, and Mutual networks would all be the same company, as they are today owned by Westwood? (General Electric owns NBC television, but sold its radio business to Westwood; Westinghouse bought CBS, changed its name to CBS, and sold its radio properties to Westwood, which has owned Mutual for a long time).

Why some stations carried mostly commercials for national products (Oxydol, Duz, Johnson's Wax) and others usually carried ads for local grocery stores and other businesses intrigued me. Only recently have I figured out that the major factor was strength of signal - a store's management would not want to pay the higher rates a more powerful station can command to advertise its specials and services to an audience 300 miles away.

In the days before demographics and narrowcasting, most stations were full-service, which means that they had a lot more programming variety, and were mostly adult oriented, except for an hour or two after school. Network and local programming was dominated by religious broadcasts until at least noon on Sunday. To broadcast a secular program too early in the day Sunday was considered sacrilegious. Interestingly even now, some Central American countries (Domini-

can Republic is one) prohibit rock and roll broadcasting during the week before Easter. Some rock stations there switch to ballads, classical, or religious music; others sign-off for the week.

At about noon on Sundays, stations here switched from religion to news, interview, commentary, and classical music, (both CBS and NBC had their own orchestras of excellent caliber and reputation); programs considered to be serious, worthwhile. Later in the day, (earlier in the day as time went on), Sunday programming became as secular as weekdays, with comedy, drama, and game programs.

And although they were not of much interest to me, I remember that from 10:30 pm till midnight every weekday night, the networks carried live dance bands from various ballrooms and hotels, such as the Cocacabana, the Waldorf Astoria, the Coconut Grove, and other Statlers and Hiltons in large cities. It seems like for years and years Vincent Lopez and his orchestra were on Mutual every night from I don't know where. The other networks had a little more variety, it seems to me. I don't remember ever hearing of Vincent Lopez before or after or in any other context.

About Chicago - my grandmother and many uncles, aunts, and cousins lived there. So we usually spent one week there each summer, and although I spent most of my time with relatives being royally entertained with visits to museums and zoos, I had time to notice a few details about the Chicago version of big city radio. At night at home, I could usually get the big ones WGN, WMAQ, WBBM, and WENR/WLS. But being live in Chicago, I also encountered for the first time ethnic broadcasting (1240 on the AM dial probably broadcast 12 languages a week, primarily European), and the unusual concept of a full-time Christian station (WMBI, owned by the Moody Bible Institute). Most religious broadcasts in radio's early days were part of secular stations' programming.

I didn't take the time to listen to radio that much in Chicago, but I read the *Tribune* schedules and still remember the programming of WIND: instead of 15 minute soaps, it had 15 minute segments of recorded artists all day - a quarter hour each of Frank Sinatra, Bing Crosby, Jo Stafford, Rosemary Clooney and so on, the schedule repeated day after day. I still wonder how many times per week some of those songs were heard, although I know Sinatra probably had enough recordings to go for days without repetition, almost.

Another thing that intrigued me about Chicago radio was that it was there that I ran into my first examples of shared frequencies. WLS and WENR both at 890 on the dial; why 2 sets of call letters? It was many years later before I found out why that occurred. And the aforementioned 1240 on the dial: a real mind-blower to me, WSBC, WFDC, and WCRW and all broadcasting foreign languages almost all the time.

On one of my trips to Chicago, my uncle, proprietor of a radio shop, gave me a car trunk full of working used radios to take back to South Dakota. About then farms were getting wired

Arthur Godfrey

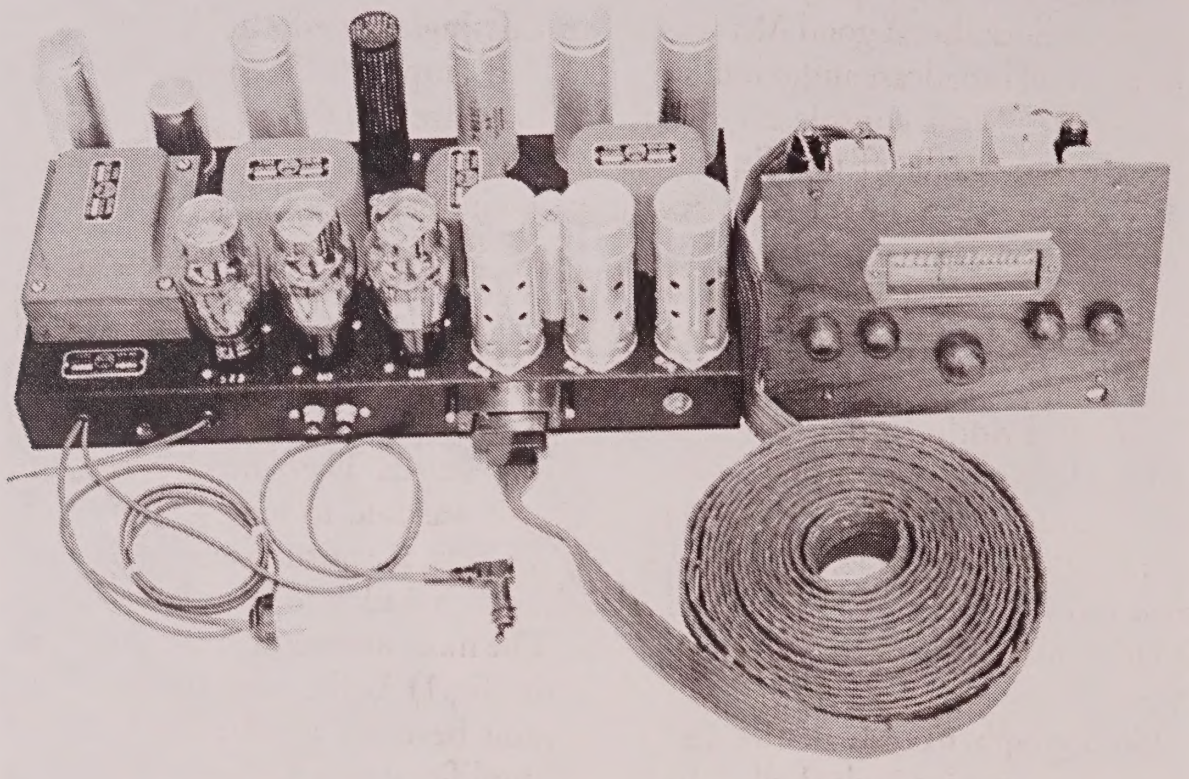
for 110 volt ac electricity for the first time, so I began a modest used radio business, selling used radios, many of which were used in barns so farmers could hear markets, news and weather while milking and doing other chores. I paid $4 per year for a sign in the barber shop advertising my business. I did some minor repairs, (replacing tubes, soldering loose connections, exchanging speakers) and by the time I graduated from high school, our basement was pretty full of radios, phonographs, and parts.

I did get a little personal airtime exposure, as the announcer for our church's weekly taped broadcast of *The Bread of Life* on KORN during my last year or two of high school.

Then I left for college, didn't have time for hobbies due to school and the Army for 7 years, transistors replaced tubes, and my career turned out to be unrelated to electronics, although I worked the control board weekends for WKLW-FM, Grand Rapids, MI for a year or so while a student.

Why haven't I mentioned listening to FM? Well, there was not one FM station in South Dakota when I lived there, and I never missed it because, after all, I never got done listening to AM. I saw an FM antenna on my cousin's house in Illinois, but he couldn't satisfactorily explain its purpose to me, especially in a city with about two dozen AM stations.

So, where did I get my extreme interest in radio along with an enjoyment of unsophisticated humor? Well, what can we expect of a lad literally growing up between WOW (Omaha, NB, 590 on the dial) and KORN (Mitchell, SD, 1490 on the dial)?



HIGH FIDELITY IN THE 1930s
The Pacent 9-R Receiver

by Harry Hyder

This unusual receiver is in the collection of Clyde and Lois Watson.

We think of the quest for high fidelity as primarily a post-WWII phenomenon, but it had its genesis in the 1930s. How high was the fidelity then? Not very.

In that decade, the only sources for music in the home were AM radio and phonograph records. Most prime time radio programs featured an orchestra, and these were broadcast "live". This was mostly popular music, but there were some concerts, such as the NBC Symphony Orchestra under Arturo Toscanini. The audio was carried to the transmitter by telephone lines, which had been "equalized" for wider bandwidth. The programs were car-

ried across the country by equalized telephone lines also. A good AM transmitter could broadcast audio tones up to 10 kHz. Most console receivers' audio response fell off rapidly above 5 kHz. This was quite satisfactory to most listeners. How much bandwidth did you need to listen to Jack Benny or Burns and Allen?

A few high-end receivers featured wider bandwidth. In the mid 1930s, a "high fidelity" AM station came on the air in the New York City area. This was WQXR, 1560 kHz. It was a classical music station. There may have been similar stations in other major cities.

Phonograph records of the 1930s were ten or twelve inch shellac discs. They had an audible hiss, and with frequent playing the hiss level increased and the higher audio frequencies on the record deteriorated. Some consoles had a built-in record player and many had facilities for connecting an external record player. When new, a symphonic disc had quite good fidelity.

Since about 1930, almost all AM radios were superheterodynes, even small table models. They gave the best performance with minimum parts count. The Pacent 9-R High Fidelity Receiver was a radical departure from standard practice. It was not a superheterodyne; it was the tuned radio frequency (TRF) type common in the 1920s. The stated reason for this was that a TRF receiver is free from the images and spurious beats that are common in superheterodynes. The set had other unusual features, such as its tone control circuits.

The input of the 9-R was a conventional single-tuned circuit driving a 6K7 rf amplifier. The second rf amplifier stage was also a 6K7. Coupling the two amplifiers was a tunable bandpass circuit, ganged to the antenna tuned circuit. An untuned rf transformer coupled the second 6K7 to the diodes of a 6R7, for detection and automatic volume control (AVC). AVC voltage is applied to both rf amplifier stages. The tunable bandpass circuit was said to have a bandwidth of 16 kHz, permitting audio frequencies up to 8 kHz to be recovered.

The most interesting part of the circuit (fig.1) is the tunable bandpass circuit between the first and second rf amplifier stages. This consists of two shielded inductances, with no magnetic coupling between them, but capacitance coupled. Both are tuned by sections of the main tuning capacitor. The circuits are "overcoupled" to widen the bandwidth. Overcoupling produces two peaks in the response, with a small valley in between. Fig. 2 shows curves of coupled circuits with various degrees of overcoupling. It also shows one circuit with "critical" coupling that produces a single peak. Some expensive superheterodynes used this type of circuit in the intermediate frequency amplifier: one overcoupled circuit plus a critically coupled circuit to fill in the valley between the two peaks. The single-tuned antenna circuit in the 9-R may have served this purpose.

Designing band-pass circuits for a single frequency is not difficult, but designing them to be tunable over the 3:1 frequency range of the AM broad-

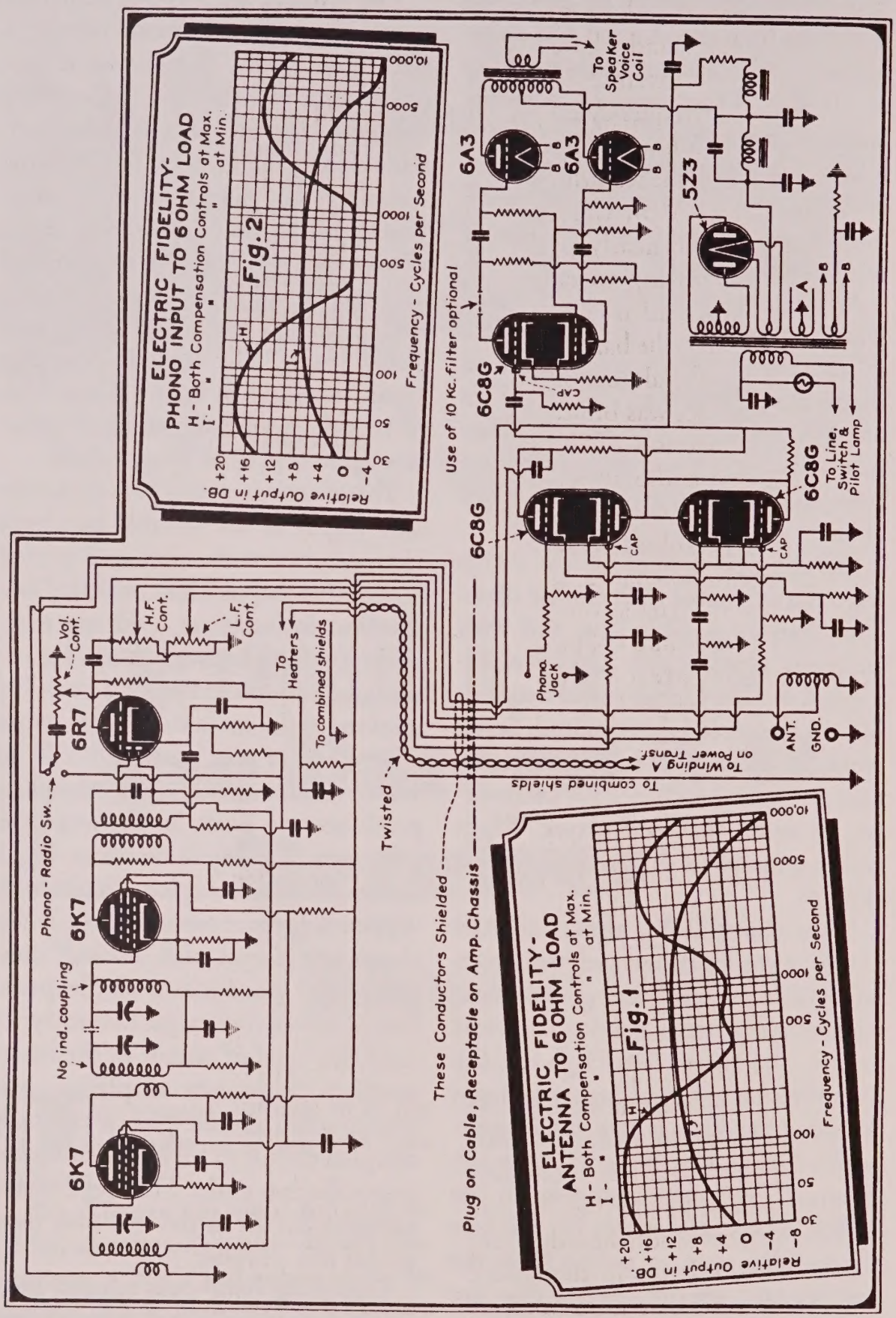

ELECTRIC FIDELITY-
PHONO INPUT TO 60HM LOAD
H - Both Compensation Controls at Max.
I - " " at Min.
Fig. 2
Relative Output in DB.
Frequency - Cycles per Second
ELECTRIC FIDELITY-
ANTENNA TO 60HM LOAD
H - Both Compensation Controls at Max.
I - " " at Min.
Fig. 1
Relative Output in DB.
Frequency - Cycles per Second
Use of 10 Kc. filter optional
To Speaker Voice Coil
6A3
6A3
5Z3
6C8G
6C8G
6C8G
CAP
To Line, Switch & Pilot Lamp
Phono Jack
ANT.
GND.
To Winding A on Power Transf.
To combined shields
These Conductors Shielded
Plug on Cable, Receptacle on Amp. Chassis
Twisted
Phono - Radio Sw.
Vol. Cont.
H.F. Cont.
L.F. Cont.
To Heaters
6R7
6K7
6K7
No ind. coupling

Fig. 1

cast band appears to be very hard. I can not help but wonder how well the shape of the bandpass filter was maintained over this frequency range. Another consideration would be aging of components and the resulting drift of characteristics. Also, the tracking would have to be nearly perfect. It would be interesting to connect a sweep generator and oscilloscope to this set to see what the bandpass curve looks like after the almost 60 years since this set was built.

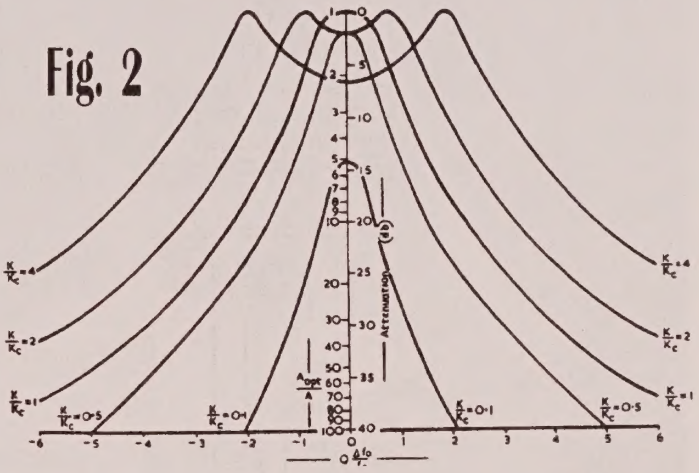
The triode section of the 6R7 is the first audio amplifier with the volume control in its grid. The volume control is on the tuner chassis, as are the bass and treble tone controls. The remainder of the audio circuits are on the power supply and audio amplifier chassis.

There are four separate low-level audio amplifier stages, using sections of the 6C8G dual triode tubes. One is for the external phonograph input. Another has a "flat" frequency response. A third has a resistance/capacitance low-pass filter in its input for amplification of low frequencies and a fourth has a high-pass filter in its input for amplification of high frequencies. The outputs of all these amplifiers are mixed by connecting the plates together. The response curves on the schematic show the "flat" response of the set and when the treble and bass controls are in their maximum position. There is no provision for bass or treble attenuation. These tone control stages are followed by a 6C8G phase inverter that drives a push-pull 6A3 power stage. The rectifier is a 5Z3.

Power and audio lines between the tuner and amplifier chassis are carried by a multi-conductor cable. Each audio line is individually shielded. The picture on page 18 shows both units.

Pacent had been a manufacturer of radio components since the early 1920s, but as far as I know the 9-R is the only complete set that he produced. It may also have been the last. It is unknown how many of these sets were produced or sold. The market for them was probably small.

Fig. 2



Clyde has connected a loudspeaker to this set and says that it sounds fine. Of course there are no high fidelity AM stations in the Phoenix area.

By 1939 FM broadcasting was starting, but stations were few and most operated only for a part of the day. FM receivers were scarce. FM does not suffer from the same fidelity limitations as AM and it could be predicted that FM would eventually be the medium for high fidelity broadcasting. It did, but WWII delayed this until the late 1940s.

Glass vs Metal Tubes

by Con Morton

In 1935 RCA produced the first successful series of metal tubes, these were initially developed by GE but put into production by RCA. As with many new developments, heated arguments soon developed concerning the advantages and disadvantages of this new electronic gizwiz. The salient features of the new tubes could be summarized as follows:

Size: the metal shell was smaller in diameter and usually shorter than a corresponding glass shell, allowing higher packaging densities.

Shielding: they were fully shielded, improving rf and low level signal operation without the use of costly tube shields, required grounding of the shell pin.

Capacitance: Reduced and more uniform interelectrode capacitance, the construction was more precise and allowed wider spacing of the pin to element leads. The element leads went straight up from the pins instead of being pinched down into a single plane. Very similar to the later all-glass miniature tubes.

Temperature: the metal tubes had a small heat transfer problem that was apparent in the power tubes such as the 6L6. The metal envelope effectively blocked radiant heat loss and the smaller envelope form reduced the surface area of the tube such that the thermal resistance of the tube was increased. Heat sinks and forced air cooling were recommended in power operations (receiving and audio tubes).

Price: manufacturing costs were greater for the metal tubes.

Visibility: opaque, users and technicians could not see either the fila-

ments or the glow due to gas.

Safety: safer to handle, users and technicians were not subject to glass cuts.

Durability: marginally more robust, glass seals and shock sensitive construction still could result in inoperative tubes when dropped.

Microphonics: the same manufacturing techniques that reduced interelectrode capacitance removed the dampening effects of the glass pinch on the leads and caused some of the tubes to be more prone to microphonics than their glass brethren.

That the new tubes were controversial is attested by the following letter issued by the F.B. Connelly Co., northwest distributors of Grunow radios. The letter is apparently meant for ner-

vous customers and salesmen who were being forced to wade into the controversy. Philco, the bad guy of the letter, and Zenith were major holdouts on the metal tube bandwagon, while Grunow seemed to take a more middle of the road approach. The text of the letter is as follows:

THE PRO AND CON OF METAL TUBES

We are quoting here a letter just received from Dr. James D. Jordan, of the General Household Utilities Company, pertaining to metal tubes, which is the subject of so much discussion today, and about which a great many members of the radio industry are somewhat bewildered. Dr. Jordan's remarks are particularly interesting, in view of the fact that he is one of the greatest authorities in the country, on the subject of vacuum tubes, which he was active in designing and manufacturing even before the war, when he was associated with the Western Electric Company.

"On September 18, 1935, Philco Radio and Television Corporation issued a leaflet entitled Be 'From Missouri'! This leaflet was one more attempt to discredit the merits of metal radio tubes which their former literature unsuccessfully tried to do. It reminds one of the farmer who recently found himself stuck with a load of 1934 potatoes. The potatoes were hauled into a town with the story that the 1935 crop was a failure and if you failed to purchase the old ones you would go hungry for potatoes this winter. Rest assured the new crop of radio tubes is here, and they are superior to the old crop in many respects, equal to in other respects and inferior to in no manner whatsoever.

It has been stated that set manufacturers using metal tubes designed their sets around hand made sample tubes and that regular production tubes did not have the same characteristics. This statement is erroneous on its face. Manufacturers of any products buy raw material based on certain characteristics. If their raw material inspection departments finds a deviation from specifications the entire lot is rejected. If you purchased a new automobile and specify red leather upholstering, a chromium plated radiator and wire wheels would you accept the machine if it was delivered with calico upholstering, a black radiator and wooden wheels? Of course you would not. Neither does a radio set manufacturer buy tubes except in strict fulfillment of a specification.

The statement was also made that 40% of all metal tubes made were defective. This statement was based on a trifle of fact. They might have used a 90% figure with almost as much truth to it, because when any tube glass or metal goes into production the shrinkage is high for a few days. The initial high shrinkage drops rapidly in a very few days and in the case of metal tubes to a much lower value than with glass tubes. This is because glass breakage in a factory is much greater than defects in metal.

Since metal can be worked to much closer limits than glass it stands to reason that the geometry of a metal tube is more uniform than that of glass. Therefore, the tube characteristics are

SEATTLE PORTLAND SPOKANE

F.B. CONNELLY COMPANY

NORTHWEST DISTRIBUTORS

Date 10/17/35 Product GRUNOW RADIO No. 70

To ALL RADIO DISTRIBUTORS List 2,3,5,7 & 13

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Since metal can be worked to much closer limits than glass it stands to reason that the geometry of a metal tube is more uniform than that of glass. Therefore, the tube characteristics are much more uniform when made of metal.

FORM 108 FBC

The letter found by the author from the F.B. Connelly Company to its radio distributors, dated October 17, 1935.

much more uniform when made of metal.

Due to the length and proximity to each other of the lead-in wires the inter-element capacities of glass tubes are exceedingly high when compared to metal tubes. It was this high interelement capacity that made it

necessary, before the advent of metal tubes, for short wave experimenters to strip the glass tube of its base and separate the lead-in wires as far as possible to obtain any results whatsoever. Is it not reasonable that if the glass tube will not perform at all on five meters, its performance on the foreign band is less satisfactory than if a metal tube is used. This interelement capacity is not measurable on a tube tester such as is used by dealers or jobbers and is therefore rather elusive. A test of the radio set on the foreign broadcast band will demonstrate definitely the superiority of the metal tubes for this particular use.

It was stated that the metal tube in operation is hotter than a glass tube. Sure it is. So what? A red hot stove is hotter to a person within two feet of it than to one six feet from it. A metal tube of a given wattage is hotter to the touch than a glass tube of the same wattage. This is true for two reasons. First, the fingers are closer to the source of heat (the filament). Second, metal is a better conductor of heat than glass and the heat tapped from the tube is almost instantly replaced by more heat from the other parts of the tube. Did you ever, in a cold bathroom, notice the difference between placing your bare foot on a rug and on a tile floor? The total heat energy liberated by a radio tube is independent of the material of the outer shell but is dependent on the watts input. It therefore follows that nearby coils, resistors, etc., in a radio set are affected alike with heat from glass or metal tubes provided the wattage is the same.

It was stated that the higher temperature of the metal tube shell will shorten the life of the metal tube. Wrong again. The shell of a tube never dies of anything but breakage and metal doesn't break. Excessive heat at the cathode (filament) will shorten life but temperature of the cathode is the starting point in designing either glass or metal tubes. As a matter of fact the temperature of the cathode is identical whether it be in a glass or a metal shell.

Since metal can be worked to closer limits than glass the elements are anchored more rigidly in the envelope of the metal tube than they are in the glass tube. This prevents michrophonism.

The envelope of a metal tube is its shield. There are not cracks or holes thru which stray fields may filter to destroy the perfect operation of the receiver. This shield is connected to one of the base prongs and a perfect grounding of the shield is insured. This may be contrasted to the poor connection between the shield and the ground made use of on glass tube sets which have caused, and are now causing, many service calls.

Metal is said to be porous and a metal tube will lose its vacuum in due course of time. Correct. All matter is porous. A metal tube will lose its vacuum to a point where it is inoperative in about 400 years, long after it has died due to other causes. In like manner, glass is porous. One method of producing photo electric cells is to force sodium thru the glass wall of the bulb. A glass tube will lose its vacuum thru the glass in about 200 years, so why should we worry.

The leaflet referred to above states that the inability to see inside a metal tube is a real disadvantage because the service man cannot tell when it is operating. Do you suppose that a service man could tell if he touched the tube? Certainly he could, if it gets as hot as the leaflet says it does.

Now a word about the cost of metal tubes being higher than that of glass tubes. Did it ever occur to you that this added cost might be compensated for by a decreased cost of shielding and wiring in a receiver? If it is not why is it that to equal the performance of a GRUNOW Model 1171, that lists for $149.50, other manufacturers charge their customers $185.00 or more, and to match in performance a GRUNOW Model 1241 that lists for $185.50 why do they charge their customers $260.00 and up?

Metal radio tubes are here to stay and GRUNOW receivers will not be permitted to lag behind in the march of progress. Glass tubes have their place, namely in the cheaper sets. That is the reason the cheaper GRUNOW sets make use of glass tubes.

Yours very truly,

GENERAL HOUSEHOLD
UTILITIES COMPANY

J.D. JORDAN
Engineer of Sales"

JDJ:he

The introduction of the miniature all glass tubes after World War II provided a cheaper and equally accurate form of construction for rf applications as well as a tube that was much less prone to breakage than the large octal ST types. The miniature tubes size, reduced power dissipation and ruggedness allowed designers to put rugged, reliable and small radios in automobiles, airplanes and every room in the house. The metal receiving tubes faded into the sunset. However one of the last receiving tube types introduced before the transistor flood, was the nuvistor, a very small metal enveloped tube.

References:

1. Eastman, Austin V., M.S., *Fundamentals of Vacuum Tubes*, Third Edition, McGraw Hill Book Co. 1949.

2. Tremain, H.M., D.Sc, FAES, *The Audio Cyclopedia*, First Edition, Howard W. Sams &Co. 1959.

3. Barbour, Eric "6L6 Forever, 1936 to 1996", *Vacuum Tube Valley*, Spring/ Summer 1996.

4. Kittleson, Charles, "RCA Tube Production, Harrison, New Jersey 1930-1976", *Vacuum Tube Valley*, Fall/Winter 1997.

Notes from the Workbench

by Joel Ekstrom W1UGX

Most good analog high-frequency communications receivers have two rf tracking adjustments for the rf, mixer and local oscillator circuits of each band - a capacity trimmer for the high end and an inductance adjustment at the low end.

Sometimes when the local oscillator (low) adjustments are made at or near the band edges, the frequency calibration accuracy is found to be poor in the middle of the band. There are three possible causes for this:

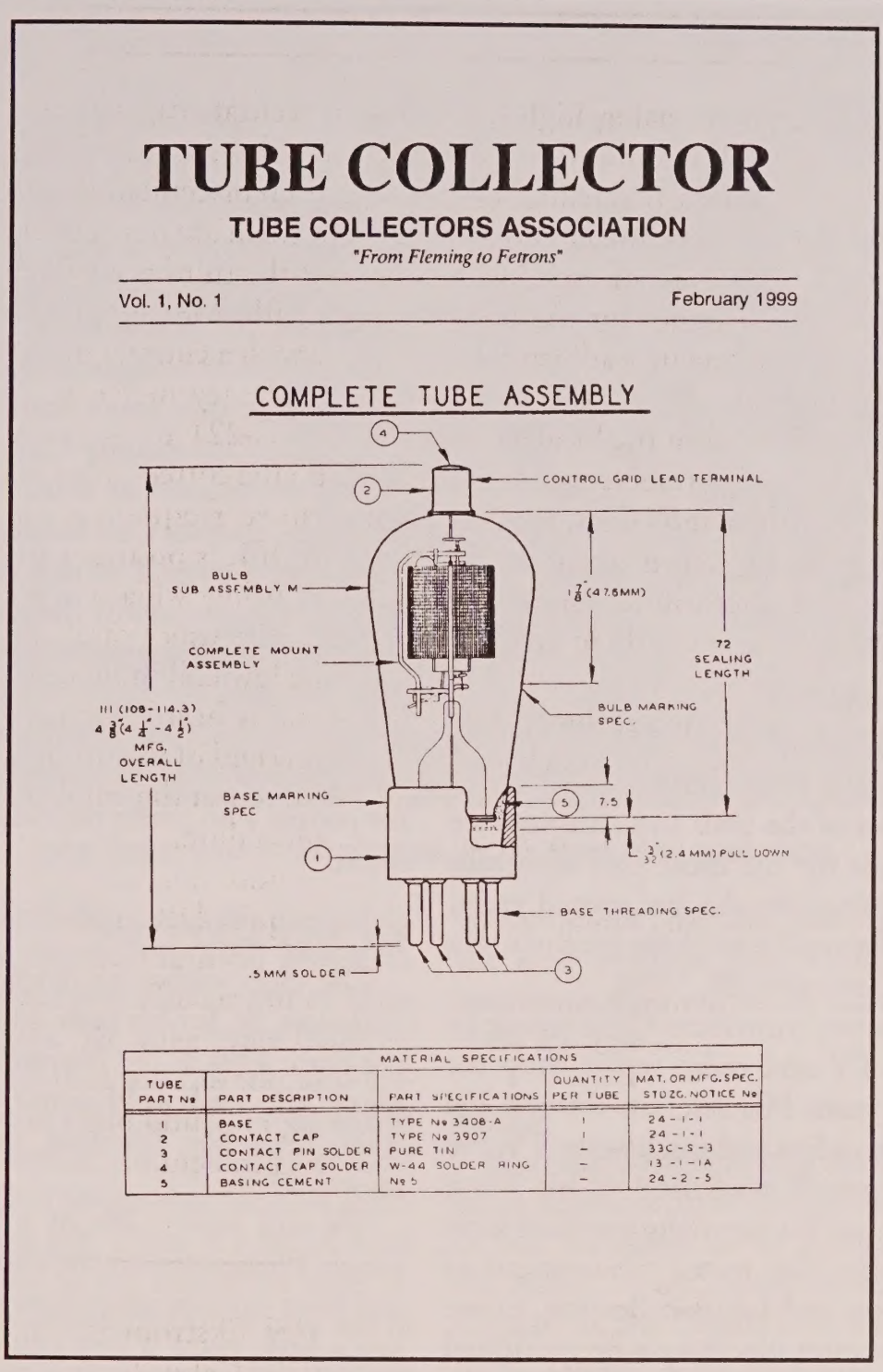
1. Poor calibration accuracy during manufacture (too much dial parallax, etc.)
2. Drift of the low series or shunt padder.
3. Low is on the wrong side of the signal.

The first is not too common and the second is hard to detect without an accurate capacity bridge to measure the suspected unit and prepare a replacement if required - most of them are not standard values. But the third is relatively easy to deal with. Measure the low frequency with a counter or a heterodyne frequency meter such as an LM or BC-221 to make sure the low is on the correct side of the signal (whose frequency must be known). If it is on the wrong side (such as below when it should be above - the usual case), then reduce the low coil inductance until the signal is heard again. Do this at the low end of the tuning range, and then repeat the whole rf alignment procedure.

The author ran into this on a recently acquired BC-1004. Calibration was accurate at 10 and 20 MHz, but way off at 15 MHz, due to low being below the signal instead of above. About an hour of sweating and fiddling sufficed to cure the problem.

Notes from the Workbench will be a regular feature in the AARC News. It is a forum for servicing ideas, restoration tips and answers to your questions. Send material to AARC Editor, 2025 E. LaJolla Dr., Tempe, 85282.

Joel Ekstrom is a member from Cabin John, MD who has a second home in Sedona. His main interest is in post-1940 test equipment and communications receivers and transmitters.



TUBE COLLECTOR

TUBE COLLECTORS ASSOCIATION

"From Fleming to Fetrons"

Vol. 1, No. 1 February 1999

COMPLETE TUBE ASSEMBLY

MATERIAL SPECIFICATIONS

TUBE PART No	PART DESCRIPTION	PART SPECIFICATIONS	QUANTITY PER TUBE	MAT. OR MFG. SPEC. STUDG. NOTICE No
1	BASE	TYPE No 3408-A	1	24-1-1
2	CONTACT CAP	TYPE No 3907	1	24-1-1
3	CONTACT PIN SOLDER	PURE TIN	–	33C-S-3
4	CONTACT CAP SOLDER	W-44 SOLDER RING	–	13-1-1A
5	BASING CEMENT	No 5	–	24-2-5

Tube Collectors Association Formed

This new group is now in operation. Started by dedicated collector/historians, it is international in scope, nonprofit, and noncommercial. It addresses tubes of all vintages and types. For a membership application and sample copy of *Tube Collector*, please contact the club at P0 Box 1181 Medford, OR 97501. Details are also available from Al Jones, W1ITX, on (707) 464-6470 or Ludwell Sibley on (541) 855-5207.

JOHN SABO

We received word that John Sabo has passed away. John was a charter member of the club and although we have not for the most part seen him at meetings for the last several years, he did attend a meeting recently. He died December 26, 1998.

John was from from Ohio where he had a TV and radio repair shop for many years. His interests were in 20s battery radios and microwave TV. He had a small workshop at his Mesa home and his surviving brothers have asked the club to sell the contents of the shop and John's collection. Some of the better pieces may be auctioned at our May meeting (not definite), the rest of it will be for sale at the upcoming swap meet in Tucson. There are many tubes, quite a few old and collector-type tubes, microphones, battery sets, parts, parts cabinets, tools, books including a nearly complete set of the *AARC News*, many pieces of test equipment covering a wide span of years, horn speakers, satellite TV equipment, video equipment, and ac radios.

The club will earn a percentage of the sale so this would be a good way to help out John's heirs and to help the club's finances as well.

DISPLAY AT HAM MEET

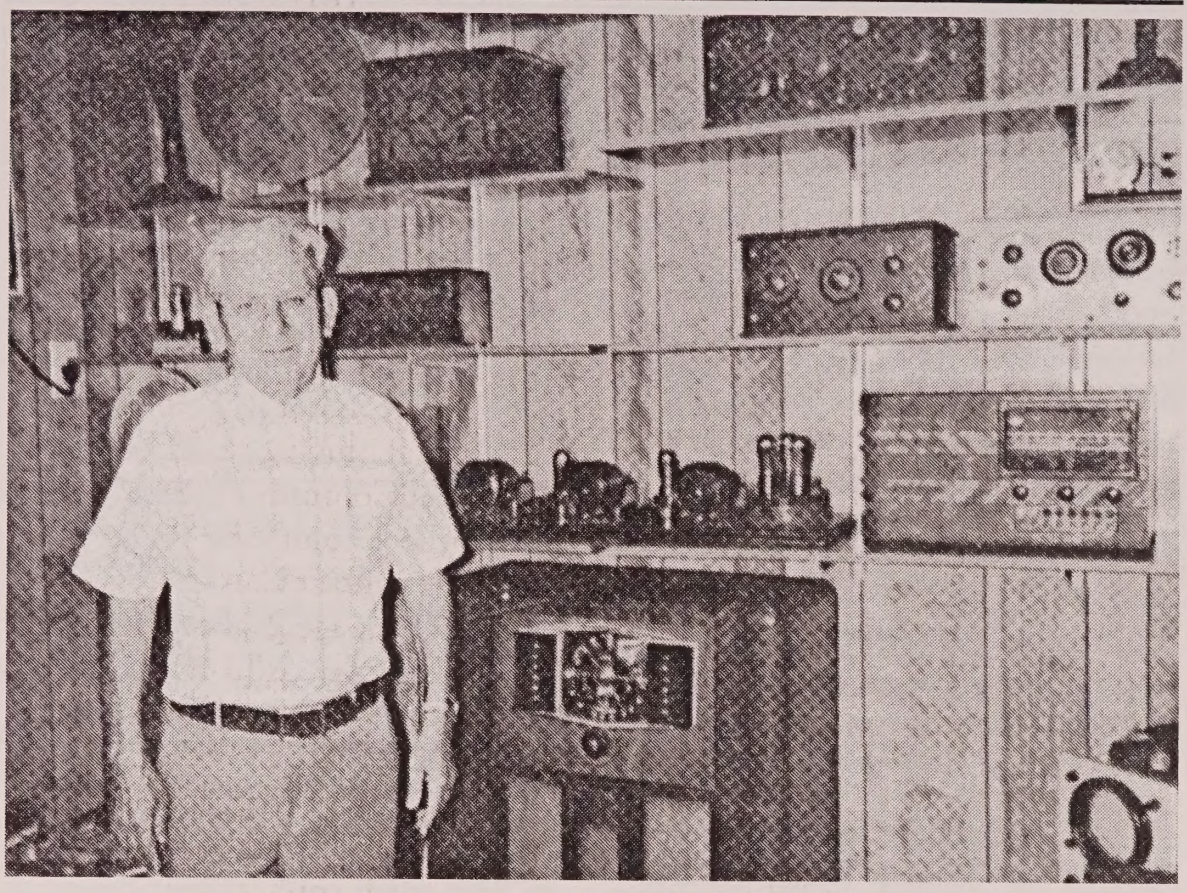
Con Morton is organizing a display of radios at this year's ham meet at Scottsdale Community College. The date is the second or third Saturday in March, contact Con for details. His phone is on page 2 of this issue. We had a very successful display a few years ago; several people brought radios and took the opportunity to sell radios nearby. Our booth promoted the club and was a nice meeting place for people who prefer the older equipment.

MONEY MATTERS

The club wishes to thank George Fathauer, Sr. for his cash donation to the club. Also, at the November swap meet, the club sold some donated items from Mr. Spurling, the net to us was $226.

We still have a bit of a financial pinch. Please support the club by paying your membership dues and adding a little extra if you can swing it. This is the last issue of the 1998 season so if you haven't paid your dues it is your last issue altogether.

We also need new members because dues are our main source of income. The economics of publishing the *Radio Club News* are that it costs us about the same money to print 1000 copies as it does 100. Therefore the per copy cost to the club goes down if we have



John Sabo in a 1990 picture, in his then new workshop.

more members to send the journal to. Promote the club to local people or to collectors you meet at out of town swap meets. We have extra issues of the journal that you can take and display at your table when you go to out of town meets. And speaking of back issues, don't forget that we have some of these to sell. There is a list of what is available on the classifieds page.

We are offering business card ads in our classified section. You can help the journal by purchasing one of these ads to make your name, collecting interests or services offered known to the club. Details are in the classifieds.

NEW COLUMN

Many people have asked for a technical question and answer column and Joel Ekstrom has stepped forward to offer one (see page 28). It won't work for long without your input. Send questions, tips, etc. to the Editor, address on page 2.

HELP

Current opportunities for volunteers: Someone to do a short write-up of our meetings, to be published in the *AARC News*. People to man our display at the Scottsdale CC ham meet, contact Con Morton. Volunteers to become AARC Board Members and Officers; elections will be held in May so please let a Board Member know if you are willing to help. Someone to contact and interview club members for personal stories and history. We also need people to do short programs at our meetings, and members willing to host meetings.

CLASSIFIEDS

CLASSIFIED ADS are free to members. **Please - no ads over the phone.** Send your ad to AARC, 2025 E. LaJolla Dr., Tempe, AZ, 85282. Specify how long you want your ad to run: one or more issues (specify), or until further notice.

BUSINESS CARD ADS support the club and let people know what you're looking for. An ad like the one at the bottom of this page is $20 for one year (4 issues). Send your card and check to AARC, 2025 E. LaJolla Dr., Tempe, AZ, 85282.

WANTED: Edison Ticker Tape machines or the square ones made by ACE Electric. Also speaker horn for model E - Edison standard phonograph. Also Ballast tubes D-110 or D-105. CECIL HOOPER, 242-4284.

ANTIQUE TUBES bought and sold. Includes brass base 201s and earlier and uncommon radio and trasmitting tubes. GEORGE H. FATHAUER, 921-9961. See http://members.home.net/fathauer.

FOR SALE: Zenith 6-S-632. (1942) Large table top radio. Original finish with some scratches, etc., on top but very nice and very clean. New capacitors. Station and tone buttons. Excellent sensitivity and very good sound. Bunis: $55.00--Stein: $90.00. Asking $85.00/offer/trade. Ken and Debbie Krol, 866-2786 or djkrol@earthlink.net.

FOR SALE: Bench power supply, 0-500 vdc@1.0 amp! (500 watt). Great for power amp design/experiments. $125 with 19" cabinet. BOB BAKINOWSKI, Tucson, (520) 624-8029.

WANTED: "Tom Thumb" radios made by the Automatic Radio Company. All models. GEORGE A. FATHAUER, 116 N. Roosevelt, Suite 121, Chandler, AZ, 85226, 961-5176.

WANTED: Top quality signal generator, in working condition with manual. RICK MOUNTJOY, 926-8174.

FOR SALE: 1951 Capehart, blonde wood cabinet, model # B1004B, serial #719279, contains AM/FM radio, turntable for 78, 33 1/3, 45 RPM records and original operating instruction booklet. Also, records from the 30s, 40s and 50s. VIRGINIA YOUNG, 946-2508. Ad submitted by non-member.

HI! I'm looking for a schematic for a GE X216A table top wood cabinet ra-

ARIZONA ANTIQUE RADIO CLUB

Dennis E. Craft

10513 E. Clinton St.
Scottsdale, AZ 85259
(602) 860-8951

Collector of
ATWATER KENT
Artifacts

CLASSIFIEDS

dio, possibly a 1948-49 model. Also need a ballast tube (RR7013). This radio has "Made in the USA" on the back, but also Spanish writing below. Call 439-5955, if not home leave a message. Thanks, STEVEN STRAPACH.

WANTED: Radio Premiums. Rings, paper, badges, etc. from Tom Mix, Lone Ranger, Orphan Annie, Amos 'n Andy, etc. LARRY STENCEL, 9176 N. 115th Pl., Scottsdale, 85259, 661-6722.

WANTED: Always looking for early crystal sets, detectors and packagedcrystals. Also early tube receivers and 1950's Germanium sets. Usually have items for trade. MATT ERDAHL, 6506 S. Dorsey Ln., Tempe, 85283, 730-0570.

DAVE'S ANTIQUES in Tucson always has over 500 radios in stock. Buy-Sell-Trade. 3210 S. Dodge #11, Tucson, (520) 790-2618.

ARIZONA ANTIQUE RADIO CLUB

PHILCO
Collector

David Lambert
3350 S. Holly Ct.
Chandler, AZ 85248
(602) 963-0262
KG7ZX
Email: DavidL2476@aol.com

REFERENCE LIBRARY: Personal library open for research by AARC members. SASE for list of books and manuals. CLYDE WATSON, 8311 Via de Sereno, Scottsdale, 85258, 948-6466.

FOR SALE: Emerson Red/White/Blue model 400 Patriot table model radio. Jim Newcomer, 945-9889. Ad submitted by non-member.

SERVICE OFFERED: Expert radio cabinet repair and refinishing to original appearence. MARK TOPPO, 439-3556.

RAISE GIANT FROGS

MARKETS WAITING!
Season Just Starting! Frog legs in big demand at good prices the year round. Millions used yearly!

FREE BOOK

WE BUY We have one of the largest frog markets in the world. Sell to us in addition to other waiting markets.

Men & Women starting in every state and Canada! Now's the time to begin. Small pond starts YOU. FREE BOOK explains unusual offer to beginners. Get this year's eggs. Write today!

American Frog Canning Co.
Dept. 119-R New Orleans, La.

Radio Club News Back Issues

A limited supply of back issues have been discovered and are available for sale. Price is $3 each, prepaid, (price includes postage.) Sales of limited issues are first come, first served. Send your order to:

Dennis Craft, Secretary
10513 E. Clinton
Scottsdale, AZ 85259

Guide to Listing:
Vol.#, No. / Issue Date / Availability

I, 1	May 1983	0
I, 2	Aug 1983	0
I, 3	Nov 1983	0
I, 4	Feb 1984	0
II, 1	May 1984	1
II, 2	Aug 1984	Many
II, 3	Mar 1985	Many
II, 4	Jun 1985	0
III, 1	Apr 1986	0
III, 2	Jul 1986	0
III, 3	Oct 1986	0
III, 4	Nov 1986	0
IV, 1	Jan 1987	Many
IV, 2	Feb 1987	Many
IV, 3	Mar 1987	Many
IV, 4	Apr 1987	0
IV, 5	May 1987	0
V, 1	Fall 1987	Many
V, 2	Winter 1988	6
V, 3	Spring 1988	2
V, 4	Summer 1988	Many
V, 5	Fall 1988	Many
V, 6	Winter 1988	Many
VI, 1	Spring 1989	Many
VI, 2	Summer 1989	6
VI, 3	Fall 1989	3
VI, 4	Winter 1989	Many
VII, 1	Spring 1990	Many
VII, 2	Summer 1990	Many
VII, 3	Fall 1990	Many
VII, 4	Winter 1990	3
VIII, 1	Spring 1991	Many
VIII, 2	Summer 1991	Many
VIII, 3	Fall 1991	Many
VIII, 4	Winter 1991	6
IX, 1	Spring 1992	Many
IX, 2	Summer 1992	Many
IX, 3	Fall 1992	4
X, 4	Winter 1992	2
X, 1	Spring 1993	4
X, 2	Summer 1993	5
X, 3	Fall 1993	4
X, 4	Winter 1993	0
XI, 1	Spring 1994	0
XI, 2	Summer 1994	0
XI, 3	Fall 1994	0
XI, 4	Winter 1994	0
XII, 1	Spring 1995	0
XII, 2	Summer 1995	0
XII, 3	Fall 1995	0
XII, 4	Winter 1995	0
XIII, 1	Spring 1996	0
XIII, 2	Summer 1996	0
XIII, 3	Fall 1996	0
XIII, 4	Winter 1996	0
XIV, 1	Spring 1997	Many
XIV, 2	Summer 1997	0
XIV, 3	Fall 1997	Many
XIV, 4	Winter 1997	0
XV, 1	Spring 1998	Many

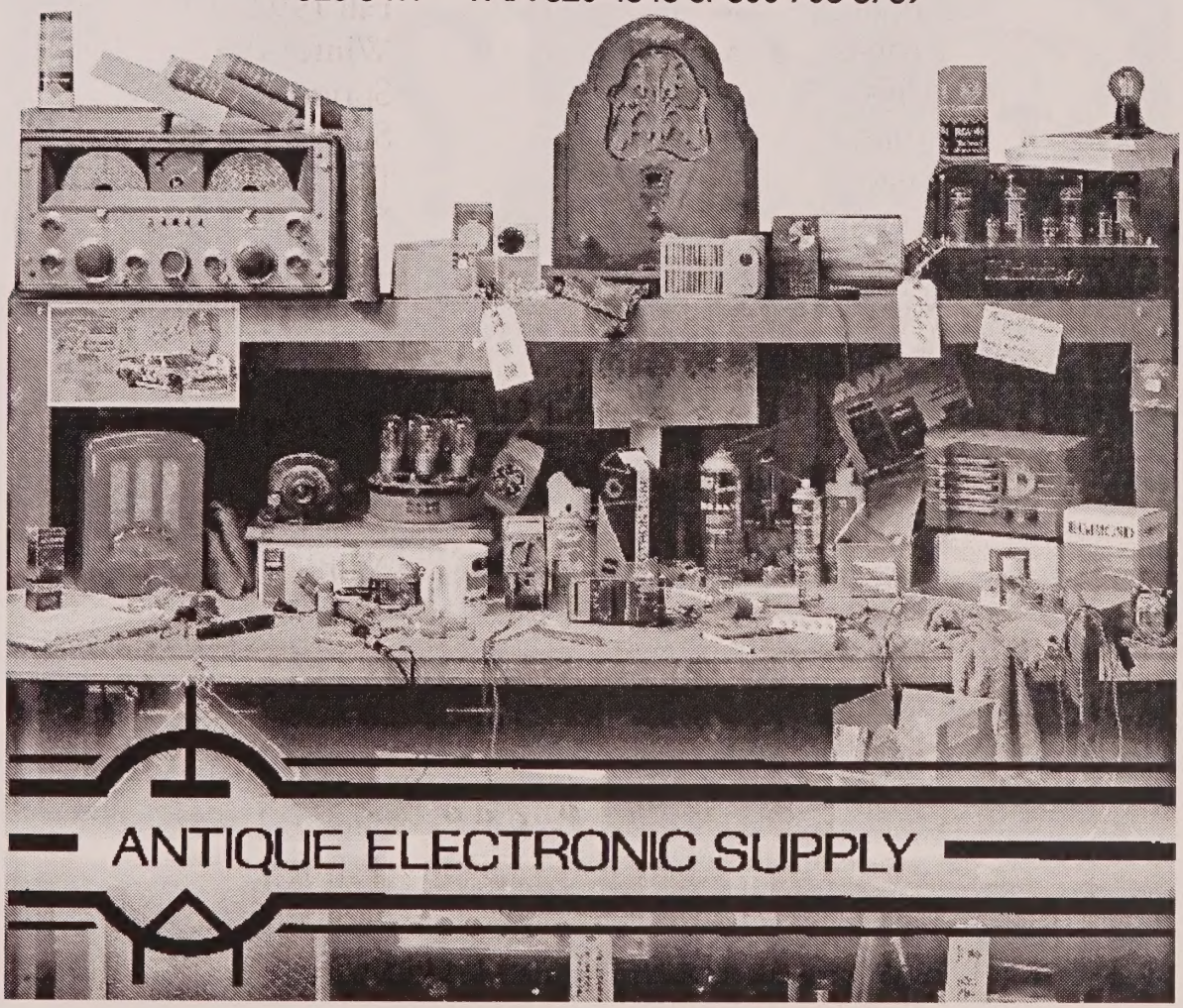
When you "*thought* you had one of those," Antique is nearby.

• Tubes-audio, receiving and industrial types in stock, including early and foreign types • Hard-to-find power transformers, audio transformers and filter chokes • Resistors, lamps, tube sockets, potentiometers, grill cloth, knobs, vibrators • High voltage electrolytic and mylar capacitors • Chemicals, test equipment, wire, batteries, tools • Literature and books on antique radios, hi-fi, communications equipment, tube data and cicuit diagrams.

Antique Electronic Supply

6221 S, Maple Ave. Tempe, AZ 85283

820-5411 FAX 820-4643 or 800-706-6789



CLASSIFIEDS

WANTED: Zenith brand tubes; two digit numbers and 6 volt G style. Particularly need several Zenith 6D6 tubes. CLYDE WATSON, 8311 Via de Sereno, Scottsdale, 85258, 948-6466.

BOB'S - BUY, SELL, REPAIR ANTIQUE RADIOS. Located in Recliner City Store, 506 E. Ft.Lowell, Tucson, 85705. (520) 623-7901

NOSTALGIA, ca. 1960s Floor Speakers. Wharfdale W70D, 4-way, bad woofers. Beautiful carved walnut enclosures. $150 pr. Also University 3-way, no model number, walnut, sounds great. $225 pr. BOB BAKINOWSKI, Tucson, (520) 624-8029.

SERVICE OFFERED: If you have a problem that you can't fix I'll take it on. Tube type receivers and audio equipment only. GEORGE H. FATHAUER, Arizona Tube Audio, 688 W. 1st St., Tempe, 921-9961.

Will You Remain a Question Mark?

No, your face will be filled in when you write for the *Radio Club News!* Your club's publication needs your articles, stories, photos, technical tips and radio wisdom to fill these pages.

Write something about your favorite radio, a clever deal, a masterful restoration, a swell swap meet. Send old pictures (we won't hurt 'em) of people and their radios. We can use before and after pictures - no questions asked.

Want to write but need an idea or an assignment - we've got plenty to go around. Even if you haven't written before, you have opinions and knowledge that other club members would enjoy. Turn that ? to a ! and contribute to the RCN today.